

Three New Species of *Brachystelma* (Apocynaceae, Asclepiadoideae, Ceropegieae) from South Tropical and Southern Africa

P. V. Bruyns

Bolus Herbarium, University of Cape Town, 7701 Rondebosch, South Africa.

peter.bruyns@uct.ac.za

ABSTRACT. Three new species of *Brachystelma* Sims (Apocynaceae, Asclepiadoideae, Ceropegieae) are described and illustrated. These are *B. pruinsum* Bruyns from the mountains of southern Angola and the Kaokoveld of northern Namibia, *B. tenuissimum* Bruyns from central Tanzania and northern Zambia, and *B. theronii* Bruyns from the western parts of the Great Karoo of South Africa.

Key words: Apocynaceae, Asclepiadoideae, *Brachystelma*, Ceropegieae.

Brachystelma Sims (Apocynaceae, Asclepiadoideae, Ceropegieae) consists of some 100 species that are widely distributed in sub-Saharan Africa. More than 70 of these 100 species occur in southern Africa (Dyer, 1980; Bruyns, 1995), but there are a few species in southeastern Asia, and one occurs as far east as Australasia (Forster, 1996). These taxa are mostly poorly recorded because the plants are geophytes that only appear above the ground during the rainy season and, even when in full growth, they are small and inconspicuous.

1. *Brachystelma pruinsum* Bruyns, sp. nov.
TYPE: Namibia. Okombambi (1712BD), 1800 m, 20 Dec. 1999, P. V. Bruyns 8021 (holotype, BOL; isotypes, K, WIND). Figure 1.

Haec species *Brachystelmati incano* R. A. Dyer simillima, sed ab eo caulibus erectioribus, foliis angustioribus, pagina interiore corollae laevi et lobis exterioribus coronae profundius bifidis differt.

Small herb arising from flattened discoid tuber to 5 cm diam.; stems ascending to erect and mostly unbranched, 5–10 × 0.1–0.2 cm, puberulous, reddish green. Leaves narrowly elliptic, 15–25 × 3–8 mm, green, puberulous, petiole to 5 mm. Inflorescences 1 to 5, alongside many of lower nodes except first 2 above tuber, each with tiny peduncle to 3 mm, with 3 to 10 flowers opening in gradual succession; pedicel 10–15 mm, brownish green, puberulous, initially ascending then spreading and later descending to hold flower facing somewhat downward, lowest flowers held very close to ground. Flowers with sepals ca. 2 × 1 mm, lanceolate, acute, adpressed to corolla, puberulous, brownish green; corolla rotate, 5–8 mm diam., outside green suffused with black, puberulous, inside purple-brown, brown in patch toward apex of lobes, pubescent toward center (and in sinuses of and along margins of lobes) with fine white spreading crinkled trichomes, 0.5–1 mm, of which those near center cling to sides of corona; corolla tube cupular, ca. 0.5 mm deep and just containing base of gynostegium; corolla lobes 2–3 × 1.5–2 mm at base, reflexed, deltate to ovate-deltate, broadly acute, margins recurved and eciliate; corona ca. 1.75 × 2 mm, glabrous, white

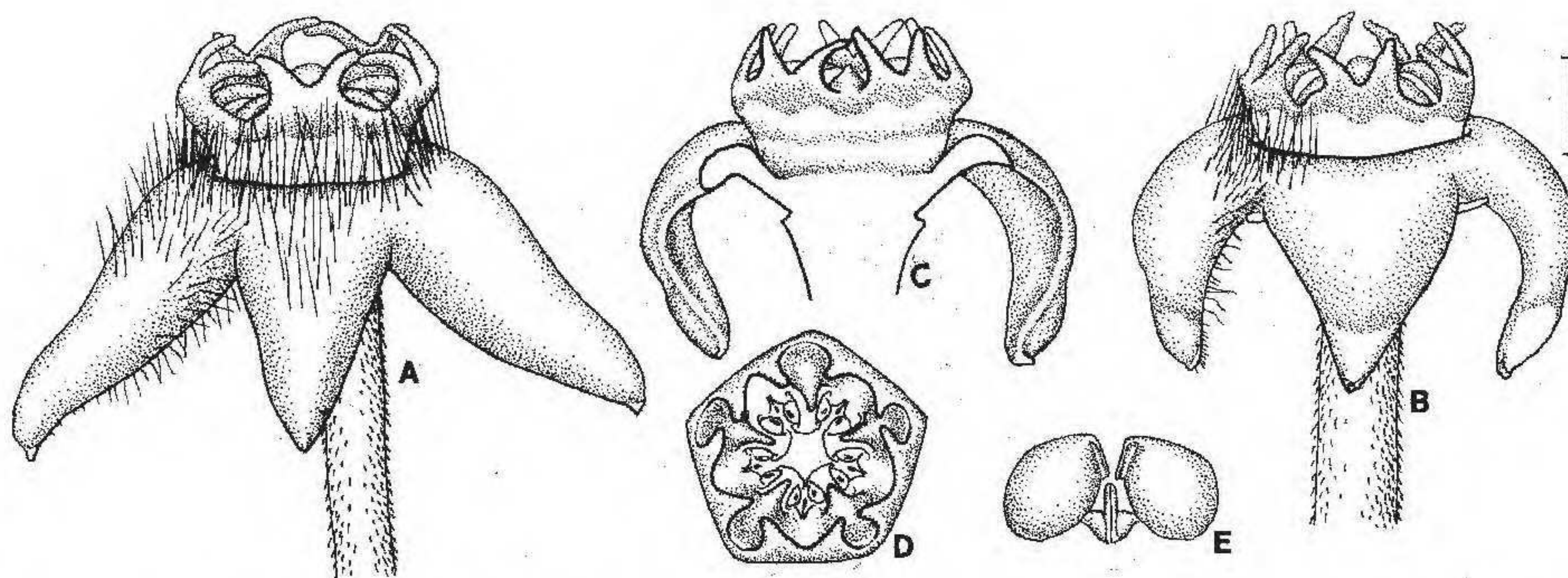


Figure 1. *Brachystelma pruinsum* Bruyns. —A, B. Side views of flower. —C. Side view of dissected corolla. —D. Face view of gynostegium. —E. Pollinarium. Scale bar, at B: A–D = 1 mm; E = 0.25 mm. A drawn from Bruyns 10661 (BOL, E); B–E, from Bruyns 8021 (BOL, K, WIND).

outside in lower half, without basal stipe; *outer lobes* ca. 1 mm, bifid to near middle into spreading flattened obtuse lobules, black; *inner lobes* less than 0.5 mm, adpressed to backs of anthers and shorter than them, narrowly deltoid, acute, black. *Fruits* and *seeds* unknown.

Habitat and distribution. *Brachystelma pruinsum* has been collected twice: one collection was made in the Kaokoveld of Namibia at the top of the Otjihipa Mountains and the other collection hails from the adjacent part of southwestern Angola (Fig. 4), where it occurred around the base of larger granite hills among trees. In both cases, it grew among rocks and a sparse covering of grasses and other small herbs in gently sloping areas.

IUCN Red List category. *Brachystelma pruinsum* should be considered Data Deficient (DD) according to IUCN Red List criteria (IUCN, 2001).

Discussion. *Brachystelma pruinsum* is most similar to *B. incanum*. In both species, the small, dark flowers are borne in small clusters on comparatively long pedicels. The two differ by the spreading habit of the stems of *B. incanum* with much broader leaves 10–15 mm across, the rugose inner surface of the corolla in *B. incanum* (smooth in the new species), and the more deeply bifid outer corona lobes of *B. pruinsum* (which are not bifid in *B. incanum*). *Brachystelma pruinsum* is unusual in the genus for the fine, crinkled, white hairs, which are plentiful near the center of the corolla, many of which cling to the sides of the gynostegium.

Superficially, there is some resemblance also to *Brachystelma arnotii* Baker and to *B. schinzii* (K. Schumann) N. E. Brown. In *B. arnotii*, the outer and inner coronas arise much lower on the gynostegium, the outer lobes do not form a cup around the anthers as in *B. pruinsum*, and the inner lobes are extremely short so that the anthers are left exposed in the center nearly to their bases. *Brachystelma schinzii* differs by the presence of pendulous marginal cilia along the lobes and the short outer corona lobes that do not rise above the level of the anthers.

Paratype. ANGOLA. North of Chitado (1613DD), 1220 m, 4 Jan. 2007, P. V. Bruyns 10661 (BOL, E).

2. *Brachystelma tenuissimum* Bruyns, sp. nov.
TYPE: Tanzania. Mpwapwa distr.: Kiboriani Hills (0636AD), 1500 m, 16 Dec. 2003, P. V. Bruyns 9641 (holotype, BOL). Figure 2.

Haec species a *Brachystelmate elegantulo* S. Moore floribus in pluries fasciculos parvos dispositis, lobis corollae 5–6 mm longis et lobis coronae exterioribus profunde bifidis in lobulos lineares patentes differens.

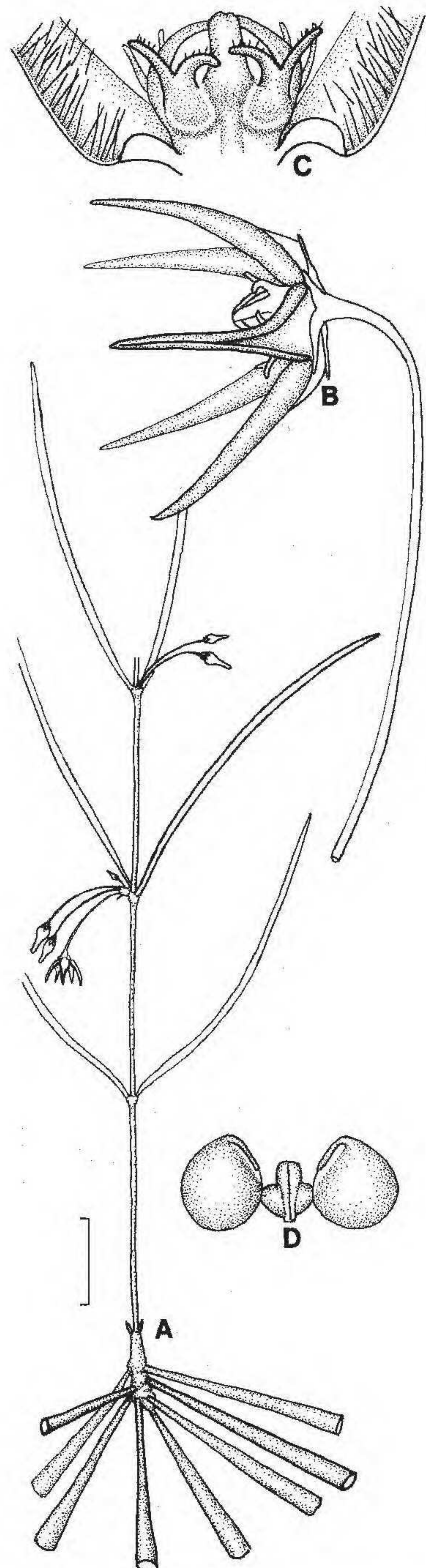


Figure 2. *Brachystelma tenuissimum* Bruyns. —A. Plant, somewhat reduced in length. —B. Side view of corolla. —C. Side view of base of dissected corolla. —D. Pollinarium. Scale bar, at A: A = 15 mm; B = 2 mm; C = 1 mm; D = 0.25 mm. A–D drawn from Bruyns 9641 (BOL).

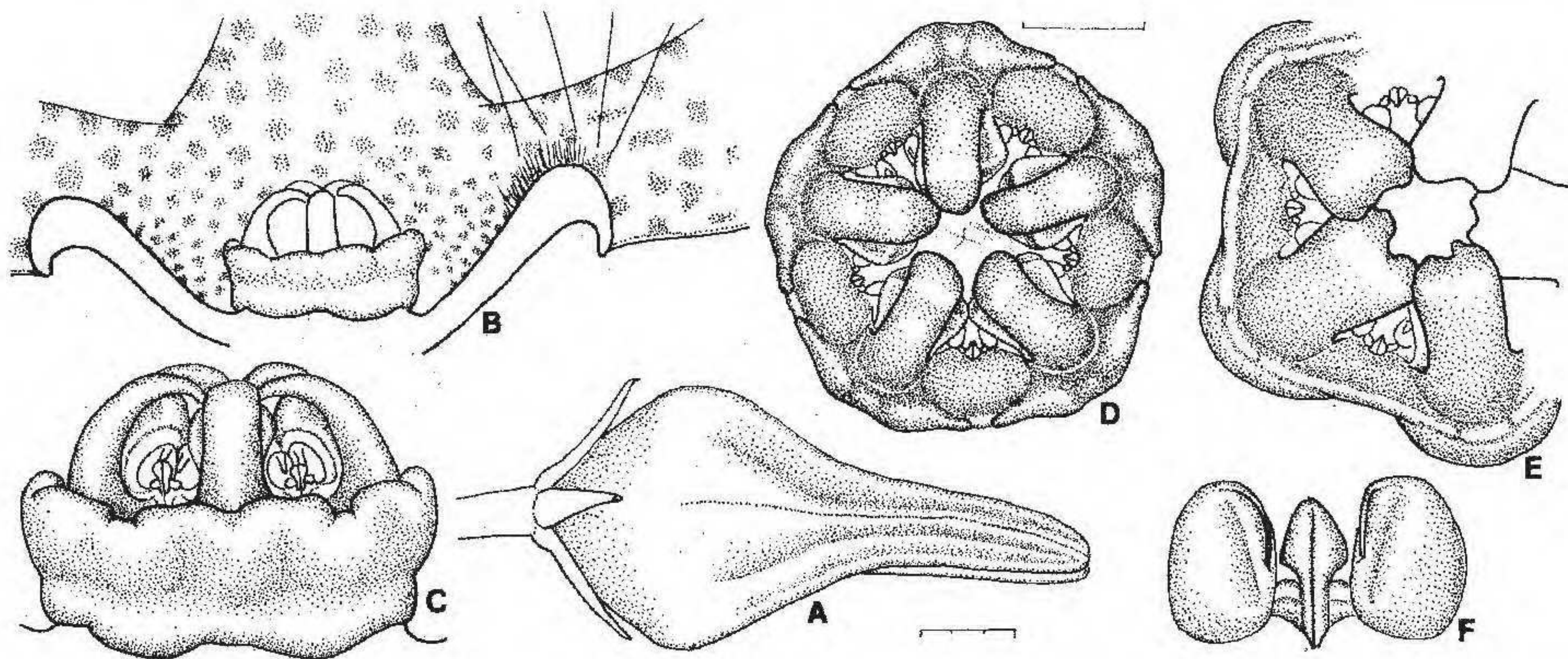


Figure 3. *Brachystelma theronii* Bruyns. —A. Bud. —B. Side view of center of dissected flower. —C. Side view of gynostegium. —D, E. Face view and detail of gynostegium. —F. Pollinarium. Scale bars: A = 3 mm; B = 2 mm (at D); C–E = 1 mm (at D); F = 0.25 mm (at A). A, E, drawn from Bruyns & Theron 4839 (BOL); B–D, F from Bruyns 3708 (BOL).

Small herb with single stem arising from cluster of thickened, swollen, whitish roots; stem erect and unbranched, 15–45 × 0.1–0.2 cm, glabrous, green. Leaves filiform, 20–65 × 2–3 mm, grayish green, nearly glabrous, slightly folded upward along midrib, sessile. Inflorescences 1 to 5, in small fascicles alongside middle to upper nodes, each with short peduncle to 3 mm, with 3 to 6 flowers opening in gradual succession; pedicel 12–17 mm, green, sparsely puberulous, descending. Flowers with sepals ca. 1.5 × 0.5 mm, narrowly lanceolate, acute, adpressed to corolla, sparsely puberulous, green; corolla rotate to slightly campanulate, 8–10 mm diam., outside green, glabrous, inside purple, finely pubescent with purple spreading trichomes up to 0.5 mm; corolla tube less than 0.25 mm deep (almost absent); corolla lobes 5–6 × 0.8–1 mm at base, ascending to slightly spreading, narrowly lanceolate, acuminate, with erect purple cilia (not swollen) along slightly recurved margins; corona ca. 1.8 × 2.25 mm, glabrous except for small hairs on lobules of outer corona, with short basal stipe; outer lobes ca. 1 mm, ascending, deeply bifid into 2 widely spreading linear lobules and fused to inner lobes only near base; inner lobes nearly 1 mm, adpressed to backs of anthers and exceeding them to meet in center, linear, obtuse. Fruits and seeds unknown.

Habitat and distribution. *Brachystelma tenuissimum* is known at present from two widely scattered localities: one in central Tanzania and the other on the northern edge of Zambia, near Lake Tanganyika (Fig. 4). It occurs in *Brachystegia*-woodland on steep to gently sloping ground among stones under trees, with very little other vegetation.

IUCN Red List category. *Brachystelma tenuissimum* should be considered Data Deficient (DD) according to IUCN Red List criteria (IUCN, 2001).

Discussion. *Brachystelma tenuissimum* is one of the species of *Brachystelma* in which the stems arise from a fascicle of swollen roots rather than a tuber. Dyer (1980) listed *B. canum* R. A. Dyer, *B. comptum* N. E. Brown, *B. franksiae* N. E. Brown, *B. gerrardii* Harvey, *B. longifolium* (Schlechter) N. E. Brown, *B. macropetalum* (Schlechter) N. E. Brown, *B. natalense* (Schlechter) N. E. Brown, *B. ramosissimum* (Schlechter) N. E. Brown, *B. sandersonii* (Oliver) N. E. Brown, and *B. schizoglossoides* (Schlechter) N. E. Brown as possessing this form of rootstock in southern Africa. Other tropical African species with this habit are *B. brownianum* (S. Moore) Meve from Angola and possibly *B. elegantulum* S. Moore from Angola. Outside Africa, this phenomenon is only known in *B. nepalense* (Radcliffe-Smith) Meve from the Himalayas of Nepal.

Some of these species were at one stage accommodated in the genera *Brachystelmaria* Schlechter and *Lasiostelma* Benthham, but were placed in *Brachystelma* by N. E. Brown (1902, 1908–1909). It has been shown (Meve & Liede, 2001) that *B. franksiae*, *B. macropetalum*, and *B. schizoglossoides* are nested among other species of *Brachystelma*, and so this species is also described as a species of *Brachystelma*.

Of all of these, *Brachystelma tenuissimum* is most similar to *B. elegantulum*, but differs in that the flowers are produced in several small fascicles along the stem (rather than terminally as in *B. elegantulum*), the corolla lobes are 5–6 mm long (vs. 12–15 mm long in *B. elegantulum*), and the outer corona lobes are pouch-like in *B. elegantulum* rather than divided into two spreading lobules as in this new species.

Paratype. ZAMBIA. Near Kalombo Falls (0831CA), 1200 m, 6 Dec. 2003, Bruyns 9603 (BOL).

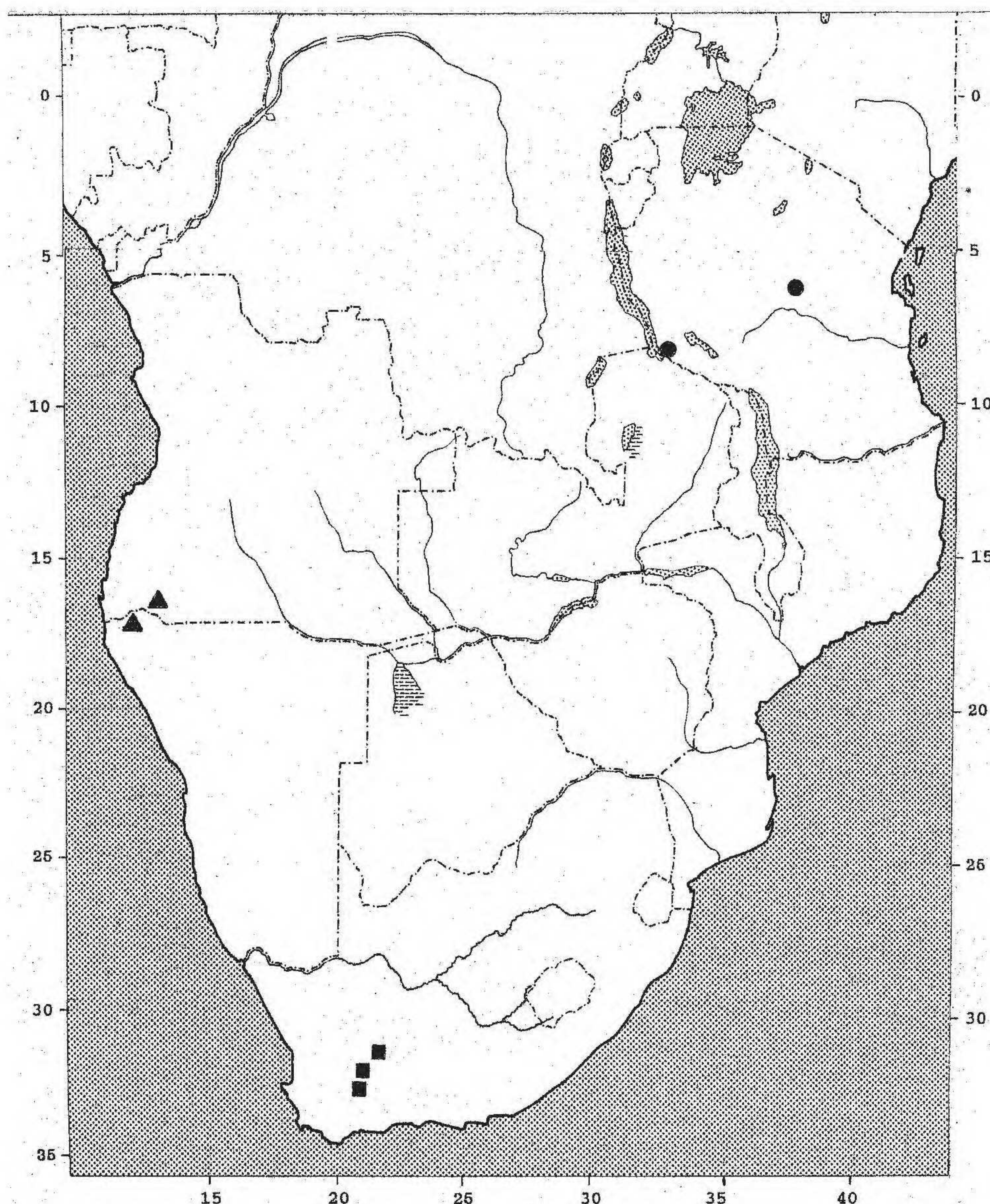


Figure 4. Known distribution of the three new species of *Brachystelma*. Triangles = *B. pruinosa*; circles = *B. tenuissimum*; squares = *B. theonii*.

3. *Brachystelma theonii* Bruyns, sp. nov. TYPE: South Africa. Fraserburg distr.: Tafelberg (3221AA), 1400 m, 2 Nov. 1991, P. V. Bruyns & A. S. Theron 4839 (BOL). Figure 3.

Haec species *Brachystelmati caudato* (Thunberg) N. E. Brown similis, sed ab eo floribus simul aperientibus, tubo corollae minus profundo, lobis corollae exterioribus non profunde bifidis et tumore nullo post lobos interiores corollae distinguenda.

Small herb to 10 cm tall arising from flattened discoid tuber to 12 cm diam.; stems ascending to erect

and branching near base, 5–10 × 0.1–0.2 cm, puberulous, gray-green. Leaves narrowly elliptic, 15–50 × 3–10 mm, gray-green, puberulous, petiole 4–6 mm. Inflorescences 1 to 3, alongside lower nodes except first 2 above tuber, each with short peduncle to 5 mm long, with 3 to 20 flowers opening nearly simultaneously usually in a dense cluster; pedicel 10–18 mm, green, puberulous, ascending to hold flower facing upward. Flowers with sepals ca. 5 × 1 mm, narrowly lanceolate, acute, adpressed to corolla, puberulous, green; corolla rotate to slightly campan-

ulate, 30–45 mm diam., outside green faintly mottled with brown, puberulous, inside cream mottled with maroon, covered especially around mouth of tube and inside tube with shaggy white spreading hairs 0.5–3 mm long, with foetid odor; *corolla tube* shallow and bowl-shaped, 2–3 mm deep and completely containing gynostegium; *corolla lobes* 15–20 × 4–6 mm at base, spreading, narrowly lanceolate, acuminate, margins slightly recurved and eciliate; *corona* ca. 2.5 × 3.5–4 mm, glabrous, apparently blackish red (actually dark yellow heavily suffused with maroon flecks), with very short basal stipe; *outer lobes* ca. 0.75 mm, forming almost continuous ring around gynostegium with slight notch in middle, distinctly thicker behind inner lobes; *inner lobes* nearly 1 mm, adpressed to backs of anthers and exceeding them, rectangular, obtuse to emarginate, slightly descending beyond anthers. *Fruit* a pair of slender follicles 80–100 × 3–4 mm, each horn of follicle bearing 18 to 25 flattened shiny blackish comose seeds, ca. 6 × 3 mm.

Habitat and distribution. *Brachystelma theronii* is found among dolerite-capped, shale hills at altitudes of 1000–1400 m on the western edge of the Great Karoo between Laingsburg and Williston (Fig. 4). Plants grow on gently sloping ground among stones and scattered small, nonsucculent shrubs, usually completely in the open and mostly around the bases of the larger hills.

IUCN Red List category. *Brachystelma theronii* should be considered Data Deficient (DD) according to IUCN Red List criteria (IUCN, 2001).

Etymology. *Brachystelma theronii* is named for A. S. Theron, who has for many years documented the flora of his own farm, Tafelberg, in the Fraserburg district of the western Great Karoo, and neighboring areas and has discovered many interesting new records of succulents and other plants in this little-collected corner of the country. Among these is this new species of *Brachystelma*.

Discussion. *Brachystelma theronii* shares many features with *B. caudatum* and has flowers of a similar size to those of *B. caudatum*. It differs from *B. caudatum* in that the flowers are produced in nearly simultaneously opening clusters, which mature before

the leaves have fully developed, usually around the middle of October. In *B. caudatum* (which also flowers in October), the flowers are produced in fascicles of two to eight among the mature leaves and open successively, the corolla tube is deeper (roughly twice the height of the gynostegium) and has steeper sides, the outer corona lobes are deeply bifid with an erect tooth on either side of the divide, and the inner lobes have a distinct swelling behind them inside the cup formed by the outer lobes.

From *Brachystelma decipiens* N. E. Brown, *B. theronii* differs by the much larger flowers (to 25 mm diam. in *B. decipiens*) with their shallowly bowl-shaped corolla tube (more cup-shaped in *B. decipiens*) and the manner in which the flowers are produced in simultaneously opening clusters (developing successively in groups of two to four in *B. decipiens*). In *B. decipiens*, the outer corona lobes are also deeply divided in the middle (unlike *B. theronii*) and have a dense cluster of white hairs on their inner faces (lacking in *B. theronii*).

Paratypes. SOUTH AFRICA. **Fraserburg distr.:** Korfplaas (3121CB), 1200 m, 1 Dec. 1991, P. V. Bruyns 4875 (BOL). **Laingsburg distr.:** near Klipfontein (3221CC), 1050 m, 19 Mar. 1988, P. V. Bruyns 3708 (BOL).

Literature Cited

- Brown, N. E. 1902. *Brachystelma*. Pp. 466–472 in W. T. Thiselton-Dyer (editor), *Flora of Tropical Africa*, Vol. 4(1). Lovell Reeve & Co., London.
- . 1908–1909. *Brachystelma*. Pp. 833–865 in W. T. Thiselton-Dyer (editor), *Flora Capensis*, Vol. 4(1). Lovell Reeve & Co., London.
- Bruyns, P. V. 1995. New records and new species of Asclepiadaceae from Namibia. *Bothalia* 25: 155–172.
- Dyer, R. A. 1980. *Brachystelma*, *Ceropegia*, *Riocrexia*. Pp. 1–91 in O. A. Leistner (editor), *Flora of Southern Africa*, Vol. 27(4). The Government Printer, Pretoria.
- Forster, P. I. 1996. *Brachystelma*. Pp. 280–282 in A. Wilson (editor), *Flora of Australia*, Vol. 28. CSIRO, Melbourne.
- IUCN. 2001. IUCN Red List Categories and Criteria, Version 3.1. Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland, and Cambridge, United Kingdom.
- Meve, U. & S. Liede. 2001. Inclusion of *Tenaris* and *Macropetalum* in *Brachystelma* (Apocynaceae) inferred from non-coding nuclear and chloroplast DNA sequences. *Pl. Syst. Evol.* 228: 89–105.